Appendix B

Documentation regarding Cumulative Watershed Effects Meeting
Agency Review of Bear Creek, Jordan Creek, Stitz Creek,
Freshwater Creek and Elk River.

CUMULATIVE WATERSHED EFFECTS MEETING
AGENCY REVIEW OF BEAR CREEK, JORDAN CREEK, STITZ CREEK, FRESHWATER CREEK AND ELK RIVER

Date: December 16, 1997
Attendees:
WQ - Frank Reichmuth, Elmer Dudik
DFG - Larry Preston, Bill Condon, Mark Moore
DMG - Jim Falls,
CDF - John Marshall(Chair), Tom Osipowich, Roger Thompson, Jeff Schimke, Joe Fassler, Pete Cafferata, George Johnson, Ernie Rohl, Jay Harris, Hugh Scanlon (notes).

Direction from the CDF Director.
A more aggressive approach to evaluating and mitigating cumulative impacts is needed -- risk of losing CDF lead agency authority if we don't do our job. Discomfort of staff in basing decisions on professional judgment needs to be overcome and well founded positions will be supported by the Department.

File updates -
Files for all subject watersheds brought up to date so written reports are incorporated as follows:

Bear Creek---DFG (8-5-97 and 10-8-97), CDF Hydrology (8-8-97), DMG (8-21-97), WQ (9-1-97 and 10-23-97)

Jordan Creek---CDF Hydrology (11-11-97), WQ (11-25-97), DMG (12-4-97)

Stitz Creek---WQ (4-27-97 and 11-20-97)

Freshwater Creek---CDF (10-30-97), CDF Hydrology (10-31-97), DMG (11-7-97), WQ (11-24-97)

Elk River---CDF (11-14-97), CDF Hydrology (12-10-97), DMG (12-14-97)

Watershed review -
Each watershed was reviewed and discussed by the group to develop a site specific approach to addressing cumulative effects issues. It was the consensus of the group that all five watersheds have had varying degrees of significant adverse cumulative watershed impacts, with timber harvesting a contributing factor. The different approaches to each watershed reflect consideration of the relative degree of impact and the future activity anticipated. Refer to the attached documents for the discussion and recommended agency approach for proposed projects in these areas.

DMG -

Debris sliding in large volumes due to last year's storms. Main drainage and eastern drainage heavily impacted by sliding and timber harvesting. Historical air photo review (1941 to 1988), tremendous increase in mass wasting though time. Difference between this area and Bull Creek in Humboldt Redwoods State Park. (unentered) is vastly different.

Contention by the landowner that sliding is the result of large rainfall events and would occur regardless of entry. Projection by Falls that the same slide rate may be possible, but the size of the slides and volume delivered is much greater. This appears consistent with research and is borne out by air photo review. Mass wasting prone areas tend to show up pretty well in photo series review, since incidence is common to skid trails.

With the identification of failure prone areas, what is the impact of harvest activities? Should the proposed projects be held until these areas are identified, risk analyzed, and mitigation developed? Larger failures doing the bulk of the damage seem to come from clearcut or heavy selection, although not thoroughly inspected in the field. Landing edge failure was a trigger, despite apparent pull-back effort. Preventing the initial failure will stop the triggering of other failures (watercourse area - inner gorge).

Hypothesis on silvicultural effect related to tree cover intercept of rainfall allowing the metering of hydrologic recharge. Absence of this cover may tend to create an effect of greater intensity for landsliding. Root strength discussion, redwood assumed different from the research for Douglas-fir root strength loss to sliding, but no research to support this finding. Cafferata points out Ziemer's work in old growth die back of 50 % with the assumption that young growth die back should be less.

Underlying geology, harvest activity, and operational timing are combined factors in determining failure likelihood. Discussion of clearcut on unstable areas. Tree retention for unstable areas is highly recommended. Questions regarding identification of failure potential.

CDF Hydrology -

Review of records show 1997 as being the biggest event on record for this drainage, bigger than 1964, based on information from other nearby gauged watersheds.

DFG -

Habitat for fish essentially erased. Habitat set back to almost zero net value for coho. Amount of timber harvesting, acres differ between agency and landowner's assessment . Restoration efforts wiped out, instream structures are likely gone and of no value. Recovery needs to occur before additional structures are likely to help. Aggradation increase, stream temperature impact, and habitat quality degradation. Additional deposition and mobilization, is to be anticipated.

Similar findings to other reports. Sources of additional material - road fill failures, generally poor practices. Inconsistencies between THP mitigation (no cut Class IIs in one plan, standard practice in others which, although site-specific, may need monitoring to determine effectiveness). WQ action in Ben Kor's letter. Controllable factors including timber harvesting cannot cause any further impacts. Technical and monitoring program reports required. Sediment budget and inventory, and develop a protocol to address future source issues.

Discussion -

Is the emphasis on fill slope failures and big ticket items sufficient? Silvicultural impact issue is unresolved. The big failures in this area from the past year seem to be related to harvest units, although not verified, but the majority of scars overall are road related. Future practice protocols need to be acceptable to the agencies. Correction of past practices with a program for completing identified items has been a problem. Proposed plans - zero net discharge? No winter operations? DFG concern that no support can be given to plan approval until some watercourse recovery begins. Reduction of input versus recovery.

Possible Mitigation Approach -

Expectation is as outlined in items (1 through 4) from the WQ letter of 10/23/97 as noted below. Sufficiency, specificity, and enforceability of proposed management protocol, work to be accomplished, monitoring, and time frames to be reviewed and determined by the agencies (WQ, DFG, CDF). Interim – No THP approval for projects within this area until the WQ requirements are met. New THPs which do not contain this information will not be considered to have an adequate cumulative watershed effects analysis and may not be accepted for filing by CDF. Legal issue—if sufficient cumulative impacts assessment done, although not as requested, can the THP still be accepted?

The following technical and monitoring program reports are required:

1. A sediment budget and inventory for lands managed by the plan submitter in this planning watershed that identifies the sources of sediment that contributed to the aggradation of this watercourse and its tributaries. The sediment budget should distinguish between sediment sources that are management related and controllable, and sediment sources that are not subject to control. The sediment budget should analyze the effects of past and current land management practices with the goal of developing changes in land management practices and techniques or timber harvest intensities that shall reduce the delivery of sediment to this watershed and its tributaries. The protocols for conducting the sediment budget and inventory are described in Appendix 20 of the draft PALCO Sustained Yield Plan/Habitat Conservation Plan.

2. A protocol for mitigating sediment production from future timber harvest activities by controlling sediment delivery identified in the sediment budget and inventory. Any future timber harvest activities must not cause any further degradation of or impede the recovery of anadromous salmonid habitat in this planning watershed.

3. A monitoring program for this planning watershed which will track the changes in stream morphology, fishery habitat, and water quality while the sediment control strategy is implemented in the watershed.

4. A time schedule for development and implementation of the sediment budget and control strategy and monitoring program identified in items 1, 2, and 3 above.

No multi-disciplinary field review conducted for this watershed.

WQ -
PHI report for THP 1-96-543 HUM requested a sediment budget. Zero net discharge incorporated into the plan.

Discussion -
Road construction has had a major impact on the drainage. Road related landslides common. Reconstruction of failed road segments, which then fail again. Expect limited activity in this area for the near future. Problems in this area are not isolated to Stitz Creek. Common throughout the Shively Road area. Stitz Creek considered a restorable Class I, but is heavily aggraded and anadromous fish passage is blocked by culvert under Shively Road, which is under the jurisdiction of Humboldt County. Zero net discharge may not be appropriate for heavily impacted watercourses..

Mitigation approach -
Identification of Stitz Creek as a watershed with adverse cumulative impacts.

Suggestions for future THP submission:

1. A planning watershed assessment of the road network should be developed to identify which roads will be needed for long-term management, and which ones may be abandoned (re-graded, fills and crossings pulled, replanting, etc.). The report should also document areas where mitigation could substantially reduce the management-induced high rate of sediment yield from the slopes within this watershed (We understand that such a study may be in progress).

2. The channel conditions should also be carefully evaluated and an inventory of the channel network should be developed in order to identify which reaches are most heavily impacted, and which ones will benefit from restoration efforts (We understand that such a study may be in progress).

3. Inventory all roads, landings and crossings in the watershed owned by the plan submitter and rate inventoried features for risk of sediment generation (i.e. low, moderate, or high). Request that a comprehensive erosion control plan be developed for the basin. Develop a program acceptable to the reviewing agencies to reduce the number of high risk sites for perched sediment along roads and landings as well as high risk crossings. Implement the program to offset new sediment which may be generated, as well as to improve channel conditions over time.

DMG -
Geologically similar to Bear Creek. Historical air photo review (1947 to 1984), mass wasting features visible in old photos, apparently, reactivated due to recent logging. The landowner contends that the drainage would have been similarly impacted by these features without entry. The geologist disagrees, believing the reduction in tree canopy would increase the mobilization of these features. Increased activity seems to have coincidentally resulted in increased inner gorge sliding. Expansion of the road system appears to have resulted in additional sliding. These slopes did not appear to have major stability problems until the extensive entries in the 1960s. Restricted harvest into the inner gorge area should be considered.

CDF Hydrology -
Flood history reviewed. Very degraded channel system. Application of rapid sediment budget is appropriate. Canopy open, filamentous algae indicator of high sunlight inputs.

WQ -
This drainage also referenced in Ben Kor's letter. Controllable factors including timber harvesting cannot cause any further impacts. Recommended items (1-4) are the same, but the same letter has not been sent.

DFG -
Severe channel aggradation. Flow goes subsurface in many places until the upper headwall areas. Occasional pockets of habitat in bedrock areas with aggraded areas in between. Records indicate presence of coho, steelhead, and Chinook, but the drainage is barely usable as habitat today. Fisheries enhancement work has not been invested in this drainage, since it was considered quite impacted years ago.

Discussion -
Building upon the Bear Creek discussion. Inner gorge failures could prompt uncut WLPZ buffers and/or wider buffers. More unroaded than Bear Creek, per current air photos.

Mitigation approach -
Expectation is as outlined in items (1 through 4) from the WQ letter of 10/23/97 as noted below. Sufficiency, specificity, and enforceability of proposed management protocol, work to be accomplished, monitoring, and time frames to be reviewed and determined by the agencies (WQ, DFG, CDF). Interim – No THP approval for projects within this area until the WQ requirements are met. New plans which do not contain this information will not be considered to have an adequate cumulative watershed effects analysis and may not be accepted for filing by CDF—a legal question for CDF staff counsel.

The following technical and monitoring program reports are suggested:

1. A sediment budget and inventory for lands managed by the plan submitter in this planning watershed that identifies the sources of sediment that contributed to the aggradation of this watercourse and its tributaries. The sediment budget should distinguish between sediment sources that are management related and controllable, and sediment sources that are not subject to control. The sediment budget should analyze the effects of past and current land management practices with the goal of developing changes in land management practices and techniques or timber harvest intensities that shall reduce the delivery of sediment to this watershed and its tributaries. The protocols for conducting the sediment budget and inventory are described in Appendix 20 of the draft PALCO Sustained Yield Plan/Habitat Conservation Plan.

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3. A monitoring program for this planning watershed which will track the changes in stream morphology, fishery habitat, and water quality while the sediment control strategy is implemented in the watershed.

4. A time schedule for development and implementation of the sediment budget and control strategy and monitoring program identified in items 1, 2, and 3 above.

DMG -

The Freshwater drainage is primarily underlain two very different geologic units, the undifferentiated Wildcat in the southern area and the Franciscan assemblage in the northeastern area. Hillslopes in the southwestern portion of the drainage are marginally stable and prone to relatively shallow debris flows and slumps. The northeast portion appears to be more stable. Several large, deep-seared ancient landslide complexes are mapped in the northeast portion of the drainage. However, the incidence of shallow landslides appears to be lower than that seen in the southwest area. Flooding due to high rainfall amounts and urban encroachment on the flood plain. Sedimentation rates appear to be above background. River complexity in lower reaches is poor due to removal of large woody debris. High flows are transporting stored sediment into the lowest gradient areas, where it is depositing and in-filling. The relative amount above "natural" levels is uncertain, but upslope land use is a factor. Road and skid trail failures are a problem in areas. Thinning vs. clearcut treatment is a question in landslide effect. Slope stability problems tend to be associated with roads & landings. Non-timberland slide (house site) also present which impacted Freshwater Creek during winter 1996-97.

CDF Hydrology -

Situations which result in an increase in peak flows described from latest Caspar Creek data. Peak flows in a watershed of this size would not be detectable as a result from clearcutting. Channel aggradation from landsliding would be more likely to aggravate flooding. Size of peak flows – evaluated Little River, Crannell. Precipitation records evaluated. Significant rainfall event in 1996. If widespread channel aggradation occurred, some increased flooding would be expected but cross-sectional data was not available to document. Now have some USGS data for Freshwater and will followup to assess changes.

WQ -

Increase in rate of harvest is expected, but concern that the monitoring proposed will not be able to capture the possible effects of harvesting. Urban impacts on watercourse noted. Possible increase in bank full discharge resulting from riparian disruption. Sources of sediment can be seen from road construction and failures. Primary concerns for the residents is more an increase in stage, not flows. Measurement of thalweg and cross-section needs to be combined to assess channel condition. Issue is more one of prevention to keep the conditions found in impacted watersheds from occurring here.

DFG -

Well over $250,000 in restoration work done in this drainage. Problems in Graham Gulch from recent sliding, possibly natural. Lack of large tree recruitment possible from past harvesting, both upstream and downstream near residences. The system was being supplemented with fish, but has gone to an all natural system. The tributaries should be evaluated separately. Material deposited in Little Freshwater Creek in the early 50's may be moving downstream now.

We have concerns for this watershed and want to keep it from suffering additional significant adverse cumulative impacts. Planning should be based on a planning watershed approach. Road and landslide inventory for the planning watershed. Monitoring station locations. Examine the flood plain studies and evaluate the degree of impact. Possible application of a "safe harbor" approach –stream protections are based on the most conservative approach. Disturbance Index (DI) of 20 percent may be too high. Use other watersheds to calibrate the DI – if excessive impacts, that DI threshold is too high. A concern is whether a cumulative impact exists in this watershed. There is consensus that a cumulative effect exists, although much less than other drainages. Status may change depending upon results from profile measurements.

Possible Mitigation Approach -

1. Cumulative watershed effects evaluated on a planning watershed basis.

2. Erosion control plan as was completed for Little Freshwater Creek for the applicable planning watershed.

3. As THPs are submitted in the future, inventoried sediment sources equivalent to the percentage of watershed to be harvested should be mitigated in the context of the approved monitoring program for the planning watershed.

4. Development of integrated thalweg and profile compliance point monitoring stations above and below Little Freshwater Creek on the main stem of Freshwater Creek. Additional upstream monitoring stations may be needed in consultation with the agencies.

5. Use of the Disturbance Index, or other similar measure, to be calculated for the planning watersheds. The index developed will be subject to calibration to determine what level of activity can be accepted and may be adjusted over time based upon monitoring results.

6. Avoidance of high risk practices from Oct 15 to June 1 — road construction, reconstruction, or upgrading; tractor operations; watercourse crossing installation; wet weather use of WLPZ roads. If high risk practices are undertaken, they shall be done under the supervision of and monitored by an RPF.

ELK RIVER REVIEW

DMG -
The watershed has been mapped by several investigators (Kelsey and Allwardt, 1987; Kilbourne, 1985(a), 1985(b); Kilbourne and Morrison, 1985) as underlain by young, lightly deformed units (Hookton Formation and Undifferentiated Wildcat Group) overlying much older heavily deformed sedimentary rocks (Yager Formation and Central Belt of the Franciscan Complex). There have been significant cumulative impacts from past operations, especially in the depositional areas downstream.

CDF Hydrology -
Concurs with significant cumulative adverse effects finding. There will be delays in routing of sediment downstream. Significant upstream storage.

Discussion -
Similar approach to Freshwater Creek, but Elk River is a higher concern.

Possible Mitigation Approach -

1. Cumulative watershed effects evaluated on a planning watershed basis.

2. Zero net discharge for the THP area. An erosion control plan for the applicable planning watershed as was completed for Little Freshwater Creek.

3. As THPs are submitted in the future, inventoried sediment sources equivalent to the percentage of watershed assessment area to be harvested should be mitigated in the context of the approved monitoring program for the planning watershed.

4. Development of integrated thalweg and profile compliance point monitoring stations above and below the confluences of the North Fork Elk River and South Fork Elk River with the main stem of Elk River. Additional upstream monitoring stations may be needed in consultation with the agencies.

5. Use of the Disturbance Index, or other similar measure, to be calculated for the planning watersheds. The index developed will be subject to calibration to determine what level of activity can be accepted and may be adjusted over time based upon monitoring results.

6. Avoidance of high risk practices from Oct 15 to June 1 — road construction, reconstruction, or upgrading; tractor operations; watercourse crossing installation; wet weather use of WLPZ roads. If high risk practices are undertaken, they shall be done under the supervision of and monitored by an RPF.

7. The North Fork Elk River WLPZ haul road should not be used in the winter period unless it is surfaced with material which does not permit fine sediment to pump to the road surface.

Note: Some sections covered with DOPE 30 additive appeared to hold up well during dry weather. Uncertain how it would withstand significant winter truck traffic.